

Amendments to the Claims

Please make the following amendments to the claims:

1. (Currently Amended) An apparatus for managing incremental storage, the apparatus comprising:

a policy management module configured to set a storage management policy for storage capacity of a virtual volume-storage pool, wherein the virtual volume storage pool is configured to store incremental storage data from an incremental storage operation on a primary volume and the virtual volume storage pool comprises a storage pool that includes at least one storage volume ~~allocated as a virtual volume~~;

a storage pool management module configured to monitor available storage capacity of the virtual volume-storage pool and to change the storage capacity in response to the storage management policy and the available storage capacity, wherein changing the storage capacity comprises allocating and de-allocating a storage volume to the storage pool of the virtual volume in response to the change to the storage capacity; and

an incremental log corresponding to the virtual volume, the incremental log configured to map a virtual address of the virtual volume assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool.

2. (Original) The apparatus of claim 1, wherein the physical storage address comprises a volume identifier.
3. (Previously Presented) The apparatus of claim 1, wherein the storage pool management module is further configured to allocate and de-allocate a portion of a storage volume to the storage pool.
4. (Currently Amended) The apparatus of claim 1, further comprising a read module configured to read data stored in the virtual volume ~~storage pool~~ by way of a data path independent from a data path used to store the incremental storage data.
5. (Previously Presented) The apparatus of claim 1, wherein the storage pool management module allocates and de-allocates storage volumes without user input.
6. (Original) The apparatus of claim 1, wherein the storage pool management module is further configured to allocate a second storage volume to the virtual volume in response to a reduction in available space on a first storage volume.
7. (Previously Presented) The apparatus of claim 1, wherein the storage pool comprises at least one storage volume corresponding to a redundant set of storage devices.

8. (Original) The apparatus of claim 7, wherein the redundant set of storage devices comprises a RAID (Redundant Array of Independent Disks) storage array.
9. (Original) The apparatus of claim 1, wherein the incremental log comprises a lookup table.
10. (Currently Amended) The apparatus of claim 1, ~~further comprising wherein~~ the storage pool management module is further configured to increase the storage capacity in response to the available storage capacity increasing above a first storage capacity threshold and to decrease the storage capacity in response to the available storage capacity decreasing below a second storage capacity threshold.
11. (Previously Presented) The apparatus of claim 10, wherein the storage pool management module is further configured to de-allocate storage volumes wherein the de-allocated storage volumes are available for allocation to a virtual volume unrelated to the storage pool.

12. (Currently Amended) A method for managing incremental storage, the method comprising:

monitoring available storage capacity of a virtual volume-storage pool and changing a storage capacity of the storage pool in response to a storage management policy and the available storage capacity, wherein the virtual volume-storage pool is configured to store incremental storage data from an incremental storage operation on a primary volume and the virtual volume comprises a storage pool that includes at least one storage volume;

allocating and de-allocating a storage volume to the storage pool in response to a change to the storage capacity of the virtual volume-storage pool, wherein the storage pool comprises at least one storage volume allocated as a virtual volume; and

mapping in an incremental log corresponding to the virtual volume a virtual address assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool.

13. (Previously Presented) The method of claim 12, further comprising providing incremental snapshot data of the primary volume in response to a replication operation.

14. (Previously Presented) The method of claim 12, wherein changing a storage capacity of the storage pool further comprises alerting a user of a storage over-utilization or under-utilization and changing the storage capacity in response to user input.
15. (Previously Presented) The method of claim 12, further comprising reading data stored in the storage pool by way of a data path independent from a data path used to store the incremental storage data.
16. (Currently Amended) A system for managing incremental storage, the system comprising:
 - a primary volume;
 - a baseline volume configured to store a baseline backup copy of data on the primary volume;
 - a storage pool configured to store incremental storage data from an incremental storage operation on the primary volume in response to changes in data stored on the primary volume after storing the baseline backup copy on the baseline volume, wherein the storage pool comprises at least one storage volume allocated as a virtual volume;
 - a policy management module configured to set a storage management policy for available storage capacity of ~~a storage pool~~ the virtual volume;

a storage pool management module configured to monitor available storage capacity of the virtual volume~~-storage pool~~ and to change the storage capacity in response to the storage management policy and the available storage capacity, wherein changing the storage capacity comprises allocating and de-allocating a storage volume to the storage pool in response to the change to the storage capacity; and

an incremental log corresponding to the virtual volume, the incremental log configured to map a virtual address assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool.

17. (Previously Presented) The system of claim 16, further comprising a replication module configured to transmit the incremental data from the primary volume to the storage pool.
18. (Previously Presented) The system of claim 17, wherein the incremental data comprises incremental snapshot data of the primary volume.
19. (Previously Presented) The system of claim 16, wherein
 - the primary volume comprises a plurality of primary volumes;
 - the storage pool comprises a storage pool corresponding to each primary volume;

the incremental log comprises an incremental log corresponding to each storage pool;
and
the storage pool management module monitors available capacity of each storage pool and allocates and de-allocates storage volumes for each storage pool.

20. (Previously Presented) The system of claim 16, wherein the storage module is further configured to allocate and de-allocate a portion of a storage volume to the storage pool.
21. (Previously Presented) The system of claim 16, wherein the baseline volume is part of the storage pool.
22. (Previously Presented) The system of claim 16, wherein the policy management module resides in a host.
23. (Currently Amended) An apparatus for managing incremental storage, the apparatus comprising:
means for monitoring available storage capacity of a virtual volume-storage pool and changing a storage capacity of the storage pool in response to a storage management policy and the available storage capacity, wherein the virtual volume-storage pool is configured to store incremental storage data from an incremental storage operation on a primary volume and the virtual volume comprises a storage pool that includes at least one storage volume;

means for allocating and de-allocating a storage volume to the storage pool in response to a change to the storage capacity of the virtual volume-storage pool, wherein the storage pool comprises at least one storage volume allocated as a virtual volume; and

means for mapping in an incremental log corresponding to the virtual volume a virtual address assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool.

24. (Currently Amended) A computer readable storage medium comprising computer readable program code for managing incremental storage, the program code configured to:

monitor available storage capacity of a virtual volume-storage pool;

change a storage capacity of the virtual volume-storage pool in response to a storage management policy and the available storage capacity, wherein the virtual volume-storage pool is configured to store incremental storage data from an incremental storage operation on a primary volume and the virtual volume comprises a storage pool that includes at least one storage volume;

allocate and de-allocate a storage volume to the storage pool in response to a change to the storage capacity of the virtual volume-storage pool, wherein the storage pool comprises at least one storage volume allocated as a virtual volume; and

map in an incremental log corresponding to the virtual volume a virtual address assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool.

25. (Previously Presented) The computer readable storage medium of claim 24, wherein the program code is further configured to provide incremental snapshot data of the primary volume in response to a replication operation.
26. (Previously Presented) The computer readable storage medium of claim 24, further comprising reading data stored in the storage pool by way of a data path independent from a data path used to store incremental data.
27. (Cancelled)
28. (Currently Amended) A method for deploying a computer readable medium for managing incremental storage, the method comprising:
- determining customer requirements for incremental storage;
 - deploying a storage management program for managing incremental storage, the storage management program comprising
 - monitoring available storage capacity of a virtual volume-storage pool and changing a storage capacity of the storage pool in response to a storage management policy and the available

storage capacity, wherein the virtual volume storage pool is configured to store incremental storage data from an incremental storage operation on a primary volume and the virtual volume comprises a storage pool that includes at least one storage volume;

allocating and de-allocating a storage volume to the storage pool in response to a change to the storage capacity of the virtual volume storage pool, wherein the storage pool comprises at ~~least one storage volume allocated as a virtual volume~~; and mapping in an incremental log corresponding to the virtual volume a virtual address assigned to the incremental storage data to a physical storage address of the at least one storage volume of the storage pool; and

maintaining the storage management program.